

ABSTRACT OF THE DISCLOSURE

In an IGBT with a built-in freewheeling diode, a thickness (D) of a polished wafer is equal to $200\text{ }\mu\text{m}$ or smaller, and each of respective thicknesses (T8) and (T9) of an N^+ -type cathode layer (8) and a P^+ -type collector layer (9) is equal to $2\text{ }\mu\text{m}$ or smaller.

- 5 Further, a total width of the N^+ -type cathode layer (8) and the P^+ -type collector layer (9) which extends along a width direction (X) is in a range from $50\text{ }\mu\text{m}$ to $200\text{ }\mu\text{m}$. In this case, an interface (IF2) between a collector electrode (10) and the P^+ -type collector layer (9) occupies 30-80% of an interface (IF) between the collector electrode (10) and the P^+ -type collector layer (9) plus the N^+ -type cathode layer (8).